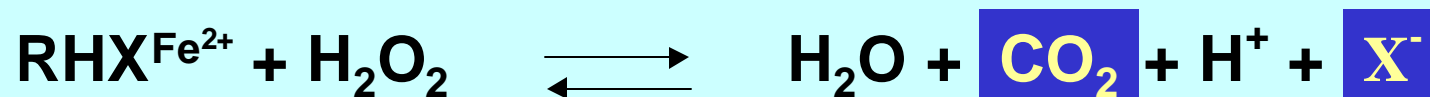
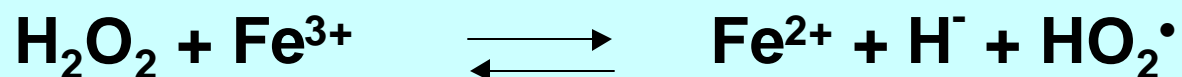
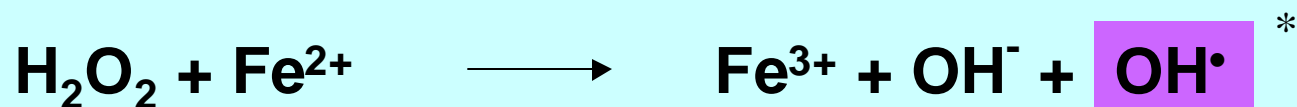


In-Situ Chemical Oxidation Using Fenton's Reagent



Fenton's Reagent Oxidation Process (FROP)



* The hydroxyl radical is a very powerful and effective nonspecific oxidizing agent. Reaction rate constant $K = 10^7$ to $10^{10} \text{ mol}^{-1}\text{s}^{-1}$

Fenton's Reagent (FR) Injection Wells

Pressure and temperature in wells are continuously monitored for facilitating control of FR pumping rates

Hydrogen Peroxide

The storage tank is separated from other chemicals in the control panel trailer

Fenton's Reagent Oxidation Process Operation

FR injection rates are controlled and monitored

Benefits

Fenton's Reagent is:

- Inexpensive
- Chemical oxidation is rapid
- Application is simple and easily controlled
- No contaminant concentration restriction
- No adverse by-products
- Reagent residues promote aerobic biodegradation

Performance & Cost Comparison

Model site plume: 50'(W) x 50'(L) x 40'(D)

	<u>Cost*</u> (\$K)	<u>Realized Savings</u> (%)	<u>Duration</u>	<u>Risk</u>	<u>Site Cleanup</u>
FROP	220	--	fast	low	near complete
Dig and Haul	850	74	slow	medium	near complete
Pump and Treat	1,250	82	long-term	medium	partial work

* Realized cost savings from using FROP.



Hydrogen Peroxide

The storage tank is separated from other chemicals in the control panel trailer



FR Injection Wells -- Pressures and temperatures in wells are continuously monitored for control of FR pumping rates